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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/053,241	01/16/2002	Partho Sarkar	GOWLVANL001AUS	3920

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EXAMINER

KALAFUT, STEPHEN J

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 09/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicant N .

10/053,241

Applicant(s)

SARKAR, PARTHO

Examiner

Stephen J. Kalafut

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-29 is/are allowed.
- 6) ☒ Claim(s) 30-42 is/are rejected.
- 7) ☒ Claim(s) 40-41 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>5,7</u> . | 6) <input type="checkbox"/> Other: _____ |

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Claims 30-38 and 40-42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase “an electrically an ionically conductive ceramic material” in claim 33 is unclear, as to whether it requires a single material to have both types of conductivity, or a mixture of materials, each having one type of conductivity. Claims 31-38, 40 and 41 depend from claim 30, and would likewise be indefinite. There is no antecedent for “the inner membrane” in claim 41, or in its parent claims 30 and 36. Should claim 41 depend of claim 39? Claim 42 is drawn to a fuel cell, but depends from claim 27, which is drawn to a method. Should claim 42 depend from claim 39? If claims 41 and 42 should depend from claim 39, the term “fuel cell” should be changed to “membrane”, to agree with claim 39.

Claims 40 and 41 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 40 recites the same shapes as in claim 33. Claim 41 recites the same materials as in claim 36.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 30-32, 34-39 and 41 are rejected under 35 U.S.C. 102(e) as being anticipated by Sammes *et al.* (US 2002/0028367).

Sammes *et al.* disclose a hollow solid oxide fuel cell (100) which includes a central fuel electrode (160) made of a mixture of ion-conductive zirconia and an electrically conductive metal such as Ni, Pd or Cu (sections 0015 and 0017); an electrolyte such as yttria-stabilized zirconia, doped LaCoO_3 or doped $\text{La}[\text{CoFe}]\text{O}_3$ (section 0020); and an outer air electrode made of strontia-doped LaMnO_3 , mixed with yttria-stabilized zirconia (section 0046), thus including electrically and ionically conductive materials. Recitations of how these components were made are treated under product-by-process practice, *in re Fitzgerald* 205 USPQ 594, and are thus not given patentable weight, since they are process limitations in product claims. When the electrolyte is a doped lanthanum (optionally with iron) compound, it would be different from the YSZ in the cathode. When the electrolyte is YSZ, it would be a solid body, while the YSZ in the cathode is porous, being mixed with the strontia-doped LaMnO_3 . The fuel electrode would also constitute an inner membrane, with the electrolyte being the outer membrane.

Claims 30-32, 34, 36-39, 41 and 42 are rejected under 35 U.S.C. 102(e) as being anticipated by Song *et al.* (US 6,436,565).

Song *et al.* disclose a hollow solid oxide fuel cell (1) which includes a central fuel electrode (2) made of a mixture of ion-conductive zirconia and the electrically conductive metal nickel (column 2, lines 14-20); an electrolyte such as yttria-stabilized zirconia (column 5, lines 12-20); and an outer air electrode made of strontia-doped LaMnO_3 (column 5, lines 51-57). Since this is the same air electrode material as presently claimed, it would inherently exhibit the

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same properties, such as having both ionic and electrical conductivity. The ceramic materials for the electrolyte and the cathode are thus different. Recitations of how these components were made are treated under product-by-process practice, *in re Fitzgerald* 205 USPQ 594, and are thus not given patentable weight, since they are process limitations in product claims. The fuel electrode would also be an inner membrane, with the electrolyte being the outer membrane.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 33 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Sammes *et al.* or Song *et al.*, each in view of Kendall (US 5,190,834).

These claims differ from Sammes *et al.* and Song *et al.* by reciting that the fuel cell may be helical, serpentine, or U-shaped. Kendall discloses a solid oxide fuel cell which may have a serpentine shape (figure 3), which includes U-shaped turns. Because this would allow a long fuel cell to occupy a space in which no single dimension is as long as its axial length, it would be obvious to shape the tubular fuel cells of Sammes *et al.* or Song *et al.* in the serpentine shape shown by Kendall.

Claims 1-29 are allowed. The prior art applied above, or cited either below or by applicants, does not disclose the present process of making a fuel cell or membrane, where an

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electronically conductive material including metal is deposited onto a conductive combustible core, which is later removed by burning. Claim 42 is so indefinite to preclude a meaningful evaluation of its patentability.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Denton (US 5,385,700) discloses a method of making a ceramic part for a rechargeable battery, in which particulate material is adhered to a core and then sintered, which is then removed by being vaporized or burnt. Sarkar *et al.* (US 2003/0134171) disclose a tubular fuel cell with a porous metal support. Nagata *et al.* (Japanese 9-283,161) disclose a method for making a tubular support similar to the present method, but using the air electrode as the central support onto which an electrolyte is deposited.

The disclosure is objected to because of the following informalities: Figure 5 is too dark and thus has no contrast. Determining its content, including its reference numerals, cannot be done. Appropriate correction is required.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Kalafut whose telephone number is 703-308-0433. The examiner can normally be reached on Mon-Fri 8:00 am-4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 703-308-2383. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.


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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

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